

CLAIMS

What is claimed is:

- 1 1. A method of managing a plurality of data communication connections having
2 differing data communication rates, comprising:
 - 3 A) assigning said data communication connections to a plurality of buckets that have
4 a circular order;
 - 5 B) establishing a bucket of said plurality of buckets as a current bucket and
6 establishing another bucket as a fast bucket;
 - 7 C) establishing a connection assigned to said current bucket as a current connection;
 - 8 D) communicating data over said current connection;
 - 9 E) in response to communicating data over said current connection, re-assigning said
10 current connection to a different bucket of said plurality of buckets based upon
11 where said current bucket resides in said circular order and a bandwidth
12 estimation of said current connection;
 - 13 F) repeating steps (C), (D) and (E) for each connection assigned to said current
14 bucket;
 - 15 G) establishing a next bucket as a new current bucket, wherein said next bucket
16 follows said current bucket in said circular order;
17 waiting until the earlier of (1) when any connection in the fast bucket is ready for
18 communication or (2) when a pre-defined period of time elapses; and
19 repeating step (F) and (G) for each bucket of said plurality of buckets.

- 1 2. The method recited in claim 1, further comprising always placing each newly
2 established connection in the fast bucket until a pre-determined number of bytes have
3 been communicated on the newly established connection.

1 3. The method recited in claim 1, further comprising:
2 measuring time elapsed in processing connections in a bucket; and
3 reducing a rate of establishing the connections when the measured time increases.

1 4. A computer-readable medium carrying one or more sequences of instructions for
2 managing a plurality of data communication connections having differing data
3 communication rates, wherein execution of the one or more sequences of instructions
4 by one or more processors causes the one or more processors to perform the steps of:
5 A) assigning said data communication connections to a plurality of buckets that have
6 a circular order;
7 B) establishing a bucket of said plurality of buckets as a current bucket and
8 establishing another bucket as a fast bucket;
9 C) establishing a connection assigned to said current bucket as a current connection;
10 D) communicating data over said current connection;
11 E) in response to communicating data over said current connection, re-assigning said
12 current connection to a different bucket of said plurality of buckets based upon
13 where said current bucket resides in said circular order and a bandwidth
14 estimation of said current connection;
15 F) repeating steps (C), (D) and (E) for each connection assigned to said current
16 bucket;
17 G) establishing a next bucket as a new current bucket, wherein said next bucket
18 follows said current bucket in said circular order;
19 waiting until the earlier of (1) when any connection in the fast bucket is ready for
20 communication or (2) when a pre-defined period of time elapses; and
21 H) repeating step (F) and (G) for each bucket of said plurality of buckets.

1 5. The computer readable media recited in claim 4, wherein the steps further comprise
2 always placing each newly established connection in the fast bucket until a pre-
3 determined number of bytes have been communicated on the newly established
4 connection.

1 6. The computer readable media recited in claim 4, wherein the steps further comprise:
2 measuring time elapsed in processing connections in a bucket; and
3 reducing a rate of establishing the connections when the measured time increases.

1 7. A computer system, comprising:
2 a processor; and
3 a memory coupled to said processor, said memory comprising one or more sequences
4 of instructions for managing a plurality of data communication connections
5 having differing data communication rates, wherein execution of the one or
6 more sequences of instructions by said processor causes the processor to
7 perform the steps of:
8 A) assigning said data communication connections to a plurality of buckets that have
9 a circular order;
10 B) establishing a bucket of said plurality of buckets as a current bucket and
11 establishing another bucket as a fast bucket;
12 C) establishing a connection assigned to said current bucket as a current connection;
13 D) communicating data over said current connection;
14 E) in response to communicating data over said current connection, re-assigning said
15 current connection to a different bucket of said plurality of buckets based upon

16 where said current bucket resides in said circular order and a bandwidth
17 estimation of said current connection;
18 F) repeating steps (C), (D) and (E) for each connection assigned to said current
19 bucket;
20 G) establishing a next bucket as a new current bucket, wherein said next bucket
21 follows said current bucket in said circular order;
22 waiting until the earlier of (1) when any connection in the fast bucket is ready for
23 communication or (2) when a pre-defined period of time elapses; and
24 H) repeating step (F) and (G) for each bucket of said plurality of buckets.

1 8. The computer system recited in claim 7, wherein the steps further comprise always
2 placing each newly established connection in the fast bucket until a pre-determined
3 number of bytes have been communicated on the newly established connection.

1 9. The computer system recited in claim 7, wherein the steps further comprise:
2 measuring time elapsed in processing connections in a bucket; and
3 reducing a rate of establishing the connections when the measured time increases.